

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Albert A. Panyard

Application No.: 10/675,474

Confirmation No.: 6003

Filed: September 30, 2003

Art Unit: 1732

For: METHOD OF MAKING HEAT TRANSFER
APPARATUS, APPARATUS THUS
MANUFACTURED, AND METHOD OF
USING SAME

Examiner: Edmund H. Lee

AMENDMENT

MS RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

INTRODUCTORY COMMENTS

In response to the Office Action mailed June 1, 2006, and as part of a Request for Continued Examination filed within the deadline of September 1, 2006, Applicant submits the following amendments and remarks.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 4 of this paper.

AMENDMENTS TO THE CLAIMS

1-20 (Canceled)

21. (New) A method for manufacturing a heat transfer device, said method comprising the steps of:

providing a length of a partially cured, silicone tubing, said tubing being capable of being further crosslinked so as to be further cured;

providing a mold;

disposing and retaining said length of tubing on a forming surface of said mold so that a first portion and a second portion of said length of tubing are disposed in contact, in a side-by-side relationship thereupon;

pressurizing said tubing so as to bias said first and second portions into said side-by-side contact with one another; and

curing said tubing so as to cause further crosslinking thereof; whereby said first portion and said second portion are bonded together.

22. (New) The method of claim 21, wherein the forming surface of said mold corresponds to a portion of a patient's body.

23. (New) The method of claim 21, wherein said step of pressurizing said tubing comprises introducing a pressurized gas into said tubing.

24. (New) The method of claim 21, wherein the step of curing said tubing comprises heating said tubing to a temperature in the range of 100-575° F.

REMARKS

Status

Claims 1-20 were originally filed. In response to a restriction requirement, claims 16-20 were withdrawn from consideration. Claims 1-15 were at issue in the Office Action mailed June 1, 2006.

The present amendment cancels claims 1-20 and substitutes therefor new claims 21-24. Accordingly, it is new claims 21-24 which are at issue.

The Office Action

In the Office Action mailed June 1, 2006, the rejection of claims 1-15 under 35 U.S.C. §103 over GB 1,366,631 taken in view of U.S. Patent 6,709,027 of Rittenhouse was maintained.

Applicant thanks the Examiner for the Office Action and for the thorough explanation of the basis of the rejection.

New Claims 21-24 Are Patentable over All of the Prior Art of Record

Applicant will briefly recapitulate the principles of the present invention so as to better differentiate it over the prior art. The presently claimed invention is directed to a method for making a heat transfer device for heating or cooling a body part. It is a notable feature of the present invention that the claimed steps of the method produce a heat transfer device which may be fabricated with a very precisely controlled structure which allows it to conform closely to an individual body part. The device of the present invention is fabricated from a length of relatively flexible tubing such as a silicone tubing, and is operative to carry a heat transfer fluid therethrough. The method steps of the present invention enable the tubing to be very precisely configured so as to fit a particular individual. Additionally, the present invention allows for

spacing and placement of the tubing so as to provide for an optimized pattern of heating or cooling. For example, by controlling tubing spacing, differential heating or cooling of different portions of a body part may be achieved.

As detailed in the specification, and as is specifically recited in the new claims, the present invention utilizes a length of partially cured silicone tubing, which may be subsequently further crosslinked so as to effectuate a full cure. The partially cured tubing is disposed upon a forming surface of a mold, and this mold is typically configured so as to correspond to a unique body part. The tubing is placed and retained on the mold so that one or more portions of the tubing are disposed in contact in a side-by-side relationship, and in a predetermined pattern, on the mold. The tubing is then pressurized, as for example by the introduction of a pressurized gas, so as to further rigidify the tubing and maintain the contacting sections in a biased together relationship. The tubing is then further cured, typically by heating, so as to crosslink the tubing, and in the course of the crosslinking, the contacting portions of the tubing are bonded together into a unitary body. The result is a uniquely shaped, very durable, monolithic, heat transfer device. All of the foregoing steps cooperate and interact to produce this device.

The previously pending claims were rejected under 35 U.S.C. §103 as being obvious in view of British Patent GB 1,366,631 of Ritson taken in view of U.S. Patent 6,709,027 of Rittenhouse.

The GB '631 patent shows a cooling device used in connection with surgery and other medical procedures. The cooling device of the '631 patent is a relatively planar device comprised of one or more spirals of tubing which are adhesively adhered to one another. In use, the cooling device of the '631 patent is placed atop or beneath the patient's body, and a cooling fluid, typically a gas, is flowed through the tubing. In formulating the rejection, the Examiner

acknowledges that the '631 patent does not show any device in which curing and crosslinking are employed to bond sections of tubing together into a monolithic body. The U.S. '027 patent was cited for the teaching of the fabrication of a capillary column device wherein in the course of fabricating the device, sections of tubing are joined together by crosslinking. In view thereof, it is the Examiner's opinion that it would be obvious for one of skill in the art to adopt the crosslinking technology of the '027 patent to bond the tubing of the '631 patent and thereby approximate the method of the claims previously at issue.

Applicant respectfully submits that the new claims overcome this rejection. The claims presently at issue are all particularly directed to a method for fabricating a heat transfer device specifically configured to uniquely fit a particular body part, and in that regard, the claims all include the limitation of forming the heat transfer device on a uniquely configured mold surface. This step is not shown or suggested in the '631 or '027 references. Furthermore, it would not be obvious to incorporate such a step into either of the prior art methods. The device of the '631 patent is of a planar configuration and is not shaped so as to conform to a uniquely configured body part such as a shoulder, foot or head. The method of the '027 patent is directed to welding lengths of tubing together in a press fit relationship, and as such precludes the use of any type of molding device therein.

Applicant further notes that new claim 21 also includes the step of pressurizing the tubing so as to urge and maintain aligned sections of the tubing in contact during the curing steps. Again, there is no such teaching in either the '631 or '027 patents. Applicant does acknowledge that the prior art, as represented by references cited by the Examiner in the previous Office Action, does utilize pressure to assist in molding processes; however, nothing in the methods of

the '631 or '027 patents, or the prior art as a whole, would suggest incorporating a pressurizing step into the process of the present invention.

The foregoing new claims find full support in the specification as originally filed. In that regard, use of the mold and benefits thereof are found in numerous places, for example in paragraphs [013] and [028]. Use of partially cured, crosslinkable silicone tubing is disclosed, for example, in paragraphs [010], [031] and [033]. Pressurization of the tubing is disclosed, for example, in paragraph [036].

Conclusion

Applicant presents herewith new claims 21-24 which are allowable. These claims recite method steps which are not shown or suggested in any of the prior art taken either singly or in combination. Applicant has also explained how the claimed steps interact to secure the unique advantages of the present invention with regard to the manufacture of a precisely configured heat transfer apparatus which may be custom manufactured for particular individuals and applications.

The application is in condition for allowance. Any questions, comments or suggestions the Examiner may have should be directed to the undersigned attorney.

Applicant draws the Examiner's attention to the fact that this case is being handled by new counsel, and Applicant's attorney respectfully requests that all further correspondence be so directed.

Respectfully submitted,

By 

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